

PUTTER-TYPE GOLF CLUB

DESCRIPTION

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BACKGROUND OF THE INVENTION

[Para 1] Field of the Invention

[Para 2] The present invention relates to a putter-type club head. More specifically, the present invention relates to a putter-type club
10 head having a rearward center of gravity.

[Para 3] Description of the Related Art

[Para 4] The golf industry has been inventing putters that make the game of golf easier for the high handicap player. One such putter is disclosed in U.S. Patent Number 4,688,798 to David Pelz.
15 The Pelz patent discloses a putter with an alignment means to assist a golfer in aiming a golf ball toward a hole during putting. The Pelz patent discloses using two or three golf ball shaped indicators as the alignment means. The golf ball shaped indicators may be circles, hemispheres, or complete spheres. The Pelz patent
20 discloses positioning the indicators along a line extending rearward from the center of percussion.

[Para 5] Another patent that discloses an alignment means is U.S. Patent Number 4,659,083 to Szczepanski. The Szczepanski patent discloses a group of lines that converge toward the center of the
25 face of the putter.

[Para 6] Yet another patent that discloses an alignment means is Great Britain Patent Application Number 4,659,083 to Lilley. The Lilley patent also discloses a group of lines that converge toward the center of the face of a putter.

- 5 [Para 7] Another example is Schmidt et al., U.S. Patent Number 5,470,068, for a Golf Putter With Dished Bottom Surfaces which discloses a putter composed of a single cast material and having a hollow interior.

- 10 [Para 8] Another example is Uebelhor, U.S. Pat. No. 6,086,484, which was filed on Mar. 20, 1998 for a Golf Putter Head. Uebelhor discloses a putter head with a U-shaped body and a block within the middle. The block has a lower specific gravity than the U-shaped body.

- 15 [Para 9] Yet another example is Rose et al., U.S. Pat. No. 5,951,412 originally filed in January of 1996 for a Golf Club, Particularly A Putter. The Rose patent discloses a center portion composed of a light metal material and the heel and toe portions composed of heavier metals. The metals are forged or cast to create the putter head.

- 20 [Para 10] Another example is Fernandez, U.S. Pat. No. 4,793,616 for a Golf Club, which was originally filed in 1984, discloses a lightweight composite material molded to a hard, high density material for distribution of mass. Fernandez discloses a composite shell with a high density insert composed of tungsten or some other
25 high density material.

[Para 11] Although these inventions have provided new and improved putters for making the game of golf more enjoyable for

high handicap players, the prior art has not optimized a putter by making it more forgiving and assisting in alignment.

5 BRIEF SUMMARY OF THE INVENTION

[Para 12] One aspect of the present invention is a putter-type club head having a body and a peripheral mass belt. The body has a face portion, a crown portion, a sole portion and a column portion. The crown portion extends rearward from the face portion to cover the column portion. The sole portion extends rearward from face portion. The peripheral mass belt is attached to the body. The peripheral mass belt has a central mass portion, a heel arc member extending outward from the central mass portion and a toe arc member extending outward from the central mass member.

[Para 13] Having briefly described the present invention, the above and further objects, features and advantages thereof will be recognized by those skilled in the pertinent art from the following detailed description of the invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[Para 14] FIG. 1 is a top perspective view of a putter-type club head.

[Para 15] FIG. 2 is a bottom plan view of putter-type club head of FIG. 1.

5 [Para 16] FIG. 3 is a top plan view of putter-type club head of FIG. 1.

[Para 17] FIG. 4 is a front plan view of putter-type club head of FIG. 1.

10 [Para 18] FIG. 5 is a heel side plan view of a body of the putter-type club head of FIG. 1.

[Para 19] FIG. 6 is an exploded bottom view of the putter-type club head of FIG. 1.

[Para 20] FIG. 7 is a top perspective view of an alternative embodiment of a putter-type club head.

15 [Para 21] FIG. 8 is a top perspective view of an alternative embodiment of a putter-type club head.

[Para 22] FIG. 9 is an isolated view of one embodiment of an alignment means for a putter-type club head.

20 [Para 23] FIG. 10 is an isolated view of one embodiment of an alignment means for a putter-type club head.

[Para 24] FIG. 11 is an isolated view of one embodiment of an alignment means for a putter-type club head.

DETAILED DESCRIPTION OF THE INVENTION

5 [Para 25] As shown in FIGS. 1–6, a putter-type club head of the present invention is generally designated 20. FIGS. 7–8 illustrate an alternative embodiment of a putter-type club head 20 of the present invention. The club head 20 preferably includes a body 22 and a peripheral mass belt 23. In a preferred embodiment, the body 22 is composed of a material having a density ranging from 0.90 g/cm³ to 6.0 g/cm³. A preferred metal for the body 22 is an aluminum alloy. Alternative materials for the body 22 include aluminum, titanium, titanium alloys, magnesium, magnesium alloys, and the like. The body 22 is preferably formed as a single cast structure using known investment casting techniques. However, those skilled in the pertinent art will recognize that alternative forming techniques such as milling, welding forged or formed pieces, and the like may be utilized without departing from the scope and spirit of the present invention.

20 [Para 26] The body 22 preferably weighs from 100 grams to 300 grams, more preferably from 150 grams to 200 grams, even more preferably from 160 grams to 180 grams and most preferably 170 grams.

25 [Para 27] The peripheral mass belt 23 is preferably composed of a material that has a density greater than the density of the material of the body 22. In a preferred embodiment, the peripheral mass belt 23 is composed of a material having a density ranging from 6.0 g/cm³ to 20.0 g/cm³, and more preferably from 7.0 g/cm³ to 10.0

g/ cm³. In a preferred embodiment, the peripheral mass belt 23 is composed of stainless steel. In alternative embodiments, the peripheral mass belt 23 is composed of zinc, brass, copper, gold, silver, tungsten, tungsten-based alloys, iron-based alloys, and copper-based alloys.

[Para 28] The peripheral mass belt 23 preferably weighs from 100 grams to 300 grams, more preferably from 150 grams to 200 grams, even more preferably from 160 grams to 180 grams and most preferably 170 grams. In a most preferred embodiment, the body 22 and the peripheral mass belt 23 have the same mass or substantially the same mass. The club head 20 preferably has a mass ranging from 250 grams to 500 grams, more preferably from 300 grams to 400 grams, and most preferably 340 grams.

[Para 29] In a preferred embodiment, the body 22 has a face portion 24, a crown portion 26, a sole portion 28 and a column portion 30. The face portion 24, the crown portion 26, the sole portion 28, the column portion 30 and the peripheral mass belt 23 define a central aperture 32 that extends through the body 22. The central aperture 32 has a heel opening 34 at a heel end 27 of the body 22 and a toe opening 36 at a toe end 25 of the body 22. The central aperture 32 horizontally separates the face portion 24 from the peripheral mass belt 23, and the central aperture 32 vertically separates the crown portion 26 from the sole portion 28. The central aperture 32, in connection with the peripheral mass belt 23, allows for the center of gravity of the club head 20, CG, to be moved rearward from the face portion 24. In a preferred embodiment, the CG of the club head 20 is positioned within the central aperture 32, and thus the CG is not positioned within material of the club head

- 20 but instead lies outside the material in the space within the central aperture 32. Preferably, the CG is located between 0.25 inch and 1.0 inch from an external surface 71 of the sole portion 28, more preferably 0.50 inch to 0.75 inch, and most preferably 0.73
- 5 inch from the external surface 71 of the sole portion 28. Also, preferably the CG of the club head 20 is located 0.50 inch to 2.5 inches rearward from the external surface 58 of the face portion 24, more preferably 0.75 inch to 1.5 inches, and most preferably 0.944 inch from the external surface 58 of the face portion 24.
- 10 [Para 30] In addition to assisting in the rearward positioning of the CG, the peripheral mass belt 23 is a rearward support structure for the crown portion 26. The peripheral mass belt 23 preferably ranges from 20 to 50 volume percent of the club head 20 and ranges from 40 to 75 weight percent of the club head 20.
- 15 [Para 31] The sole portion 28 preferably has an approximate T-shape. The external surface 71 of the sole portion 28 contacts the ground when the club head 20 is used with a shaft and grip, both not shown, as a putter. The CG of the club head 20 preferably lies above the sole portion 28.
- 20 [Para 32] The crown portion 26 extends rearward from the face portion 24. The crown portion 26 has a central elongated section 44 and a front section 46. The front section 46 has a width w' that extends from the heel end 27 to the toe end 25 of the face portion 24, and gradually narrows as the front section 46 transitions into
- 25 the central elongated section 44. The width, w' , preferably ranges from 2.5 inches to 5.0 inches, more preferably from 3.5 inches to 4.5 inches, and most preferably 4.25 inches. The central elongated

section 44 has a width w'' that is less than the width w' of the front section 46. The width, w'' , preferably ranges from 1.0 inch to 3.0 inches, more preferably from 1.5 inches to 2.25 inches, and most preferably 1.8 inches. The internal surface 48 of the crown portion 26 partially defines the central aperture 32. The crown portion preferably has a thickness that ranges from 0.10 inch to 0.50 inch, more preferably 0.15 inch to 0.30 inch.

[Para 33] The external surface 38 of the crown portion 26 preferably has an alignment means 40 thereon. The external surface 38 also preferably has a cylindrical rod 54 extending upward therefrom for engagement with a shaft, not shown. As shown in FIGS. 7 and 8, a preferred alignment means 40 is first and second inserts 40a and 40b disposed within first and second recesses in the crown portion 26. The depth of each of the recesses is preferably within 0.05 inch to 0.50 inch, more preferably 0.1 inch to 0.250 inch. Each of the circular inserts 40a and 40b preferably has a thickness ranging from 0.05 inch to 0.50 inch, more preferably 0.1 inch to 0.250 inch.

[Para 34] In a preferred embodiment, each of the circular inserts 40a and 40b is preferably composed of a thermosetting polyurethane material such as described in U.S. Patent Number 6,273,831, entitled Golf Club Head with A Polymer Insert, assigned to Callaway Golf (the assignee of the Present Application), which is hereby incorporated by reference in its entirety. Alternatively, each of the circular inserts 40a and 40b may be composed of a thermoplastic polyurethane. Each of the circular inserts 40a and 40b is preferably colored white, through painting or doping of the polyurethane with coloring agents, and each circular insert 40a and

40b preferably has a texture of a golf ball cover. Each of the circular inserts 40a and 40b preferably has a diameter ranging from 1.62 inches to 1.70 inches, and most preferably 1.68 inches. Those skilled in the art will recognize that more than two circular inserts 40a and 40b may be utilized without departing from the scope and spirit of the present invention.

[Para 35] Alternative alignment means are disclosed in U.S. Patent Number 4,688,798, entitled Golf Club And Head Including Alignment Indicators, assigned to the Callaway Golf (the assignee of the Present Application), which pertinent parts are hereby incorporated by reference. As disclosed in U.S. Patent Number 4,688,798, the alignment means assists a golfer in properly aiming a golf ball toward a hole when putting. Alternative alignment means, including a large white strip may be utilized in the present invention.

[Para 36] FIGS. 9-11 illustrate various alignment means 40 for the club head 20. In these embodiments, the alignments means is a relatively flat strip of a composite material or a thermoplastic material which is placed within a recess, not shown, in the crown portion 26 of the body 22.

[Para 37] The face portion 24 preferably has a thickness ranging from 0.10 inch to 0.50 inch, more preferably 0.20 inch to 0.35 inch. The face portion 24 has an internal surface 60 that partially defines the central aperture 32. The external surface 58 of the face preferably has a face recess, not shown, therein with a face insert 50 disposed therein such as disclosed in U.S. Patent Number 6,238,302, entitled A Golf Club Head With An Insert Having Integral

Tabs, assigned to Callaway Golf (the assignee of the Present Application), which is hereby incorporated by reference in its entirety. As disclosed in U.S. Patent Number 6,238,302, the face insert 50 is preferably composed of a thermosetting polyurethane material and is preferably colored white. In an alternative embodiment, the face portion 24 is a non-insert blade as is known in the art.

[Para 38] The body 22 preferably has a length, L, from the face portion 24 to the rearward most end of the peripheral mass belt 23, preferably ranging from 2.5 inches to 4.5 inches, more preferably from 3.0 inches to 4.0 inches, and most preferably 3.43 inches. In one alternative embodiment, the body 22 has a length, L, that is equal to the width, w'.

[Para 39] As mentioned previously, the central aperture 32 is defined by the internal surface 60 of the face portion 24, the internal surface 48 of the crown portion 26, the internal surface 56 of the sole portion 28 and the internal surface 62 of the peripheral mass belt 23, and the internal surface of the column portion 30.

The distance from the internal surface 48 of the crown portion 26 to the internal surface 56 of the sole portion 28 preferably ranges from 0.01 inch to 1.50 inches, more preferably 0.25 inch to 1.0 inch, and most preferably 0.5 inch. The distance from the internal surface 60 of the face portion 24 to the internal surface 62 of peripheral mass belt 23 preferably ranges from 1.0 inch to 3.50 inches, more preferably from 1.5 inches to 3.0 inches, and most preferably 2.00 inches.

[Para 40] The peripheral mass belt 23 preferably includes a central mass portion 80, a heel arc member 82 and a toe arc member 84. The heel arc member 82 and the toe arc member 84 extend outward from opposing ends of the central mass portion 80. The central mass portion 80 has a recess 86 for placement of the column portion 30 therein. The heel arc member 82 has a projection 90a for placement within a recess 95a (shown in dashed lines in FIG. 6) of the face portion 24. The toe arc member 84 has a projection 90b for placement within a recess 95b (shown in dashed lines in FIG. 6) of the face portion 24. The peripheral mass belt 23 is preferably bonded to the body 22 using an adhesive, with the adhesive preferably placed around the column portion 30 that engages the central mass portion 80 and within the recesses 95a-b. Alternatively, the peripheral mass belt 23 is press-fitted into engagement with the body, or secured using mechanical fasteners, such as screws.

[Para 41] The putter-type club head 20 preferably has a moment of inertia about the I_{zz} axis through the center of gravity ranging from 3750 g-cm² to 4200 g-cm² , and more preferably 3950 g-cm² to 4100 g-cm². The I_{zz} axis extends from the sole to the crown.

[Para 42] In a preferred embodiment, the heel arc member 82 and the body 22 form a heel space 101, and the toe arc member 84 and the body 22 form a toe space 103. The heel space 101 and the toe space 103 allow for the mass of the club head 20 to be extended outward from the center of gravity to increase the moment of inertia without adding more mass to the club head 20.

[Para 43] From the foregoing it is believed that those skilled in the pertinent art will recognize the meritorious advancement of this invention and will readily understand that while the present invention has been described in association with a preferred embodiment thereof, and other embodiments illustrated in the accompanying drawings, numerous changes, modifications and substitutions of equivalents may be made therein without departing from the spirit and scope of this invention which is intended to be unlimited by the foregoing except as may appear in the following appended claims. Therefore, the embodiments of the invention in which an exclusive property or privilege is claimed are defined in the following appended claims.

